AMENDMENTS TO THE CLAIMS

1. (Currently amended) A method of generating a representation of the compositional distribution of a chemical sample as a function of depth for facilitating an analysis of the quality of the chemical sample, comprising:

irradiating the sample with radiation having a plurality of frequencies in the range from 25GHz to 1OOTHz;

detecting radiation reflected from and/or transmitted by said sample to obtain a time domain waveform;

obtaining frequency data as a function of time from the time domain waveform; and

deriving the representation from the frequency data, wherein the representation shows whether the compositional distribution is uniform.

2. (Currently amended) A method of generating a representation of the granularity of a chemical sample as a function of depth for facilitating an analysis of the quality of the chemical sample, comprising:

irradiating the sample with radiation having a plurality of frequencies in the range from 25GHz to 1OOTHz;

detecting radiation reflected from and/or transmitted by said sample to obtain a time domain waveform;

obtaining frequency data as a function of time from the time domain waveform; and

deriving the representation from the frequency data, wherein the representation shows whether the granularity is uniform.

3. (Previously presented) The method according to claim 1 wherein the sample is a pharmaceutical sample.

4. (Previously presented) The method of claim 1 wherein frequency data as a function of time is obtained from the time domain waveform using a Gabor transform.

5. (Original) The method of claim 4 wherein the Gabor transform is implemented using a windowed Fourier transform, a correlation of a specific kernel function or a filter-bank.

6. (Previously presented) The method of claim 4 further comprising applying the Gabor function to the time domain waveform and selecting frequency, window type and/or window width of the Gabor function to optimise spectral or temporal features.

7. (Previously presented) The method according to claim 1 wherein the compositional distribution representation is a three dimensional representation.

8. (Previously presented) The method according to claim 1 further comprising:

subdividing the sample to be imaged into a two-dimensional array of pixels,

detecting radiation from each pixel; obtaining a time domain waveform for each pixels; and

obtaining frequency data as a function of time for each pixel from the respective time domain waveforms;

deriving a representation as a function of depth at each pixel from the respective frequency data; and

combining the representations for each pixel into a three dimensional compositional distribution representation for the sample.

9. (Previously presented) The method according to claim 1 further comprising:

subdividing the sample to be imaged into a two-dimensional array of pixels,

detecting radiation from each pixel;

obtaining frequency data as a function of time for each pixel from the respective time domain waveforms;

deriving a cross-sectional compositional representation from the respective frequency data.

10. (Previously presented) The method of claim 1 wherein the radiation is pulsed.

Claims 11-13. (Canceled)

14. (Withdrawn) The method according to claim 1 as used in a pharmaceutical manufacturing process.